CLAIMS

What is claimed is:

1. A polynucleotide encoding a plant cytochrome P450 enzyme associated with the synthesis of delta12-epoxy fatty acids or the complement thereof.

2. An isolated polynucleotide comprising a first nucleotide sequence selected from the group consisting of:

(a) a first nucleotide sequence encoding a polypeptide which is a cytochrome P450 enzyme associated with the synthesis of delta12-epoxy fatty acids wherein said polypeptide has at least 50% identity based on the Clustal method of alignment when compared to a polypeptide of SEQ ID NO:2; and

(b) a second nucleotide sequence comprising a complement of the first nucleotide sequence.

3. A chimeric construct comprising the isolated polynucleotide of Claim 1 operably linked to at least one suitable regulatory sequence.

4. An isolated host cell comprising the chimeric construct of Claim 3.

5. A host cell comprising an isolated polynucleotide of Claim 1.

6. The host cell of Claim 5 wherein the host cell is selected from the group consisting of yeast, bacteria, and plant.

7. A method of selecting an isolated polynucleotide that affects the level of delta-12 epoxy fatty acids in a host cell, the method comprising the steps of:

(a) making an isolated polynucleotide comprising the polynucleotide sequence Claim 1;

(b) introducing the isolated polynucleotide into the host cell of claims 5 or 6;

(c) determining presence or absence of delta-12 epoxy fatty acids in the host cell of (b).

8. The method of Claim 7 wherein the isolated polynucleotide consists of a nucleotide sequence of SEQ ID NO:1.

9. A method of obtaining a nucleic acid fragment encoding a cytochrome P450 enzyme associated with the synthesis of delta-12 epoxy fatty acids comprising the steps of:

(a) probing a cDNA or genomic library with an isolated polynucleotide comprising the nucleotide sequence of SEQ ID NO:1 and a complement of such nucleotide sequences;

(b) identifying a DNA clone that hybridizes with the polynucleotide of (a) or the complement thereof;

(c) isolating the identified DNA clone; and

(d) sequencing a cDNA or genomic fragment that comprises the isolated DNA clone.

10. A method for producing delta-12 epoxy fatty acids in a host cell which comprises:

(a) transforming the host cell of claims 5 or 6 with the chimeric construct of Claim 3;

(b) growing the transformed host cells of step (a); and

(c) determining the presence or absence of delta-12 epoxy fatty acids in the transformed cells of (b).